

Claims:

1. A method to characterize an array of polymeric materials comprising:  
depositing wettable material onto a substrate in at least 10 regions,  
thereafter contacting the substrate with a non-wettable material thereby rendering the  
substrate non-wettable but not the wettable material in said regions,  
optionally, partially or completely removing the wettable material,  
depositing at least 10 polymeric materials onto said regions, and  
characterizing the materials.
2. The method according to claim 1, wherein the wettable material is an unsilanizable  
material which is deposited onto a silanizable substrate and the non-wettable material is an  
organosilane agent which silanizes the substrate but not the unsilanizable material.
3. The method of claims 1 or 2 wherein said deposition step additionally comprises  
overlaying a template comprising holes for said regions onto said substrate, the template  
comprising holes at regular known intervals and depositing said wettable material onto said  
substrate through said holes.
4. The method of any one of claims 1 to 3 wherein the wettable material is deposited onto  
the substrate via thermal deposition or vapor deposition.
5. The method of any one of claims 1 to 4 wherein the wettable material comprises a  
group 6, 7, 8, 9, 10, or 11 metal from the Periodic Table of the Elements or combinations  
thereof.
6. The method of any one of claims 1 to 5 wherein the non-wettable material is an  
organosilane agent which is represented by the formula:  $R_nSiX_{4-n}$  where each X is  
independently a halogen, hydroxy or alkoxy, each R is independently selected from the group  
consisting of alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl,  
heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted  
heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, and combinations  
thereof; and n is 1, 2 or 3.

7. The method of claim 6 wherein X is chlorine, fluorine or bromine.
8. The method of claims 6 or 7 wherein n is 1.
9. The method of claim 6 wherein n is 1, each X is chlorine, and R is an alkyl or substituted alkyl.
10. The method of any one of claims 1 to 9 wherein the non-wettable material is fluorophilic, hydrophobic or hydrophilic.
11. The method of any one of claims 1 to 10 wherein the characterization is by infrared spectroscopy or X-ray fluorescence.
12. The method of any one of claims 1 to 11 wherein the wettable material is selected from the group consisting of Au, Cr, Ag, Cu, Ni, Pd, Pt, Mo, W, Co and combinations thereof.
13. The method of any one of claims 1 to 12 wherein the at least 10 polymeric materials are polymers of one or more olefin monomers.
14. The method of any one of claims 1 to 13 wherein the at least 10 polymer materials are different from each other.
15. The method of any one of claims 1 to 14 wherein each region has a hole therethrough and the polymeric materials cover the hole.
16. A method for forming an array of polymeric materials to be characterized onto a substrate comprising:
- (a) selecting ten or more different polymers,
  - (b) dissolving or suspending each polymer in a separate liquid, and
  - (c) depositing a uniform amount of each of the ten or more polymer containing liquids onto a substrate in individual wettable regions.
17. The method of claim 16 wherein the regions are hydrophilic and/or hydrophobic.

18. The method of claim 17 wherein the regions have unsilanizable material deposited thereon prior to the dispensing step.

19. The method of claim 16 wherein the substrate has been prepared by overlaying a template containing holes onto a substrate, depositing wettable material onto the substrate, thereafter contacting the substrate with a non-wettable material, and optionally removing part or all of the wettable material.

20. The method of claim 19 wherein the substrate is silanizable, the wettable material is unsilanizable material and the non-wettable material is an organosilane agent.

21. The method of any one of claims 16 to 20 wherein the same polymer containing liquid is deposited multiple times at the same region on the substrate.

22. The method of any one of claims 16 to 21 wherein the volume of liquid per unit area of the region is in the range of from about  $0.1 \mu\text{L}/\text{mm}^2$  to about  $5 \mu\text{L}/\text{mm}^2$ .

23. The method of any one of claims 16 to 22 wherein the polymer forms a film having a thickness of at least about 0.1 to about 1000  $\mu\text{m}$  at the center of the film.

24. The method of any one of claims 16 to 23 wherein the liquid has been removed from the polymer containing liquid after deposition onto the substrate.

25. An array of polymeric materials for use in characterization, comprising:

(a) a substrate having multiple regions on the substrate that are not coated with a non-wettable material and wherein the uncoated regions have a boarder of a non-wettable material coated on the substrate, and

(b) a polymer deposited on the regions not coated with a non-wettable material.

26. The array of claim 25 wherein the non-wettable material is an organosilane agent.

27. The array of any one of claims 25 or 26 wherein there are at least 10 regions on the substrate.

28. The array of claim 27 wherein there are at least 50 regions on the substrate.
29. The array of any one of claims 25 to 28 wherein the contact angle between the polymer and the substrate is at least 90°.

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30. The array of any one of claims 25 to 29 wherein the substrate has a hole through it in the regions not coated with the non-wettable material and the polymer covers the hole.

31. The array of any one of claims 26 to 30 wherein the organosilane is represented by the formula:  $R_nSiX_{4-n}$  where each X is independently a halogen, hydroxy or alkoxy, each R is independently selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, and combinations thereof; and n is 1, 2 or 3.

32. The array of claim 31 wherein n is 1, each X is chlorine, and R is an alkyl or substituted alkyl.

33. The array of any one of claims 25 to 32 wherein the polymer is a polymer of one or more olefin monomers.